ROYAL ASTRONOMICAL SOCIETY.

Vol. VI. *April* 12, 1844. No. 6.

Francis Baily, Esq., President, in the Chair.

Lieut.-Colonel John Hambly Humfrey, late Royal Staff Corps, was balloted for, and duly elected a Fellow of the Society.

M. Emile Plantamour, Director of the Observatory at Geneva, and Professor of Astronomy in the Academy at Geneva, was balloted for, and duly elected an Associate of the Society.

The following communications were read:—

I. Additional Observations of Faye's Comet, made at the Observatory of Trinity College, Dublin, by Mr. C. Thompson, accompanied by an explanation of the method of observation and reduction. Communicated by Sir W. Hamilton.

The telescope of the equatoreal instrument with which the observations were made,* was purchased from Cauchoix of Paris, the aperture of the object-glass being rather more than 5 inches, and the focal length $4\frac{1}{2}$ feet.

The circles were made and divided by Mr. Jones of London; the hour-circle to intervals of 10′, and the declination-circle to intervals of 5′; the former is usually read off to seconds of time, and the latter to minutes (or sometimes to half-minutes) of space. The clock has a mercurial pendulum, and goes pretty well.

The comet was usually observed twice in one evening, both circles being read off each time. The comparisons in both elements of the comet and the star were made in an unmoved position of the polar axis. The clock was compared carefully each night with the transit clock. The deviation of the polar axis of the instrument is considerable, but its amount is known, and the numerical corrections for this and other smaller instrumental errors are believed to be tolerably constant.

The observations are cleared of the effects of refraction, but not

* Monthly Notice for March 1844, page 55.

of parallax, no assumption having been made with respect to the comet's distance from the earth.

During the month of January the comet was compared with ξ *Orionis*, whose assumed apparent right ascension is $5^h\ 5^m\ 10^s{\cdot}33$, and assumed apparent north polar distance $87^\circ\ 19'\ 45''{\cdot}6$ throughout. In February, the comet was compared with α *Orionis*, whose place is taken from the *Nautical Almanac*.

A very full tabular statement of the reduction of the observations accompanied the explanation.

The following are the additional observed places of the comet :—

Day.	Sidereal Time.	Right Ascension of Comet.	North Polar Dist. of Comet.
1844.	h m s	h m s	° ′ ″
Feb. 15	7 24 21	5 30 14·37	82 51 38·0
19	5 47 2	34 34·18	25 54·3

II. Meridian Observations of the Moon and Moon-culminating Stars, made at Hamburg during the years 1838 and 1839. By C. Rumker, Esq. Communicated by Dr. Lee.

III. Elements of the Comet of Mauvais. By M. Götze. Communicated by Dr. Lee.

The elements are

T = 1843, May 6·033292 Greenwich Mean Time.

Log. q = 0·2083948

ϖ = 281° 27′ 47″·58 } On the ecliptic, and from the Mean
Ω = 157 14 51·45 } Equinox of 1843, July 3.
i = 52 44 0·98

The co-ordinates referred to the ecliptic, and the mean equinox of 1843, July 3, are :—

$x = r\,[9{\cdot}9783885] \sin (v + 19^\circ\ 58'\ 0''{\cdot}36)$
$y = r\,[9{\cdot}8320335] \sin (v + 269\ 30\ 33{\cdot}00)$
$z = r\,[9{\cdot}9008179] \sin (v + 124\ 12\ 56{\cdot}13)$

The places of the comet deduced from the above elements are compared with the places deduced from observations made at various observatories, from March 3 to September 2, 1843, and the agreement is very close throughout.

IV. Observations of the Comet of Encke, made at the Royal Observatory of the Cape of Good Hope in May 1842. Communicated by Thomas Maclear, Esq.

The comet was first seen by Mr. Mann on May 2, and con-

tinued visible till May 22, though on that day it was too faint for observation.

The instrument employed was Dollond's 46-inch achromatic telescope of $3\frac{3}{4}$ inches aperture, mounted equatoreally on a portable stand, and armed with an annular micrometer. The interior and exterior radii of the ring were determined with great exactness from a great many experiments. The times were noted by a half-seconds' chronometer compared at proper intervals with the transit clock. Attempts were generally made to observe at both the exterior and interior edges of the ring, and the observations for each diameter have been computed separately, and the results differ widely from each other. The observations are given in detail, and the apparent places of the stars of comparison, which have been since observed with the meridian instruments, are also given.

The following table contains the places of the comet deduced from the observations:—

Date.	Cape Mean Time.	Right Ascension.	Declination.
1842.	h m s	h m s	° ′ ″
May 2	17 25 23·7	1 18 53·63	− 8 26 28·5
4	17 10 4·6	1 10 35·42	10 14 18·1
4	17 10 4·6	1 10 36·06	10 14 30·0
4	16 58 18·1	1 10 37·05	10 14 40·0
4	16 58 18·1	1 10 37·22	10 14 30·0
5	17 24 3·7	1 6 36·82	11 8 5·0
11	16 15 28·6	0 45 3·26	15 31 6·0
13	16 19 0·7	0 38 34·86	16 47 48·0
17	15 31 14·3	0 26 29·07	19 3 57·0
17	15 34 36·8	0 26 27·81	19 4 1·0
17	15 31 14·3	0 26 29·62	19 3 53·0
17	16 27 26·6	0 26 21·09	19 5 56·0
17	16 42 45·4	0 26 19·19	19 6 12·0
17	16 46 19·5	0 26 18·63	19 6 29·0
18	16 28 58·8	0 23 26·73	19 37 16·0
19	15 56 25·3	0 20 37·23	20 8 2·0
20	16 17 47·4	0 17 40·54	20 39 16·0
20	16 38 16·8	0 17 33·53	−20 41 37·0
21	17 29 33·8	0 14 41·62	.....

V. An Account of the Erection of the Herschel Obelisk at the Cape of Good Hope, accompanied by the Report of Colonel Lewis, and a Plan of the same. By Thomas Maclear, Esq.

At the last meeting of the Committee appointed to superintend

the erection of the Herschel Obelisk, held on the 2d of March, 1842, it was resolved that a plan of the same, together with that part of Colonel Lewis's Report, which refers to its construction and erection at Feldhausen, should be forwarded by Mr. Maclear to the Royal Astronomical Society of London, with a request of the Committee that the same might be published in the *Memoirs* of the Society.

Mr. Maclear's engagements did not give him the requisite leisure for complying with the request of the Committee, and for collecting the additional information respecting the history of the obelisk, till the end of the year 1843.

The following is an abstract of the explanation furnished by him :—

Sir John Herschel, during his residence at the Cape, was President of the South African Literary and Scientific Institution. When he was about to leave the colony, the members expressed a desire to present him with some token of remembrance; and, at a full meeting, a few days before his departure, a gold medal was presented, with the impress of the institution on one side and a suitable inscription on the reverse. The feelings excited on that interesting occasion strongly evinced how much the members regretted the loss of their president and their admiration of one whose talents place him so far above ordinary men, and whose private life was a pattern of every domestic virtue.

The sum subscribed having exceeded the expense of the medal, another subscription-list was opened with the intention of raising a fund for the purpose of placing a substantial structure on the site of the 20-feet reflector in the garden of Sir John's late residence at Feldhausen. The proposal was accordingly laid before Sir George Napier, who entered warmly into the project, and placed his name at the head of the list annexed to a handsome subscription. In the course of a few days the sum subscribed amounted to 190*l.*

At a general meeting, held on the 28th of November, 1838, the erection of the obelisk was finally determined on; and a committee was appointed to carry its erection into effect.

A fruitless attempt to procure a granite column at the Cape, of proper workmanship and within the resources of the Committee, led to the adoption of a suggestion, that one of Craigleith stone, from the quarry near Edinburgh, might be obtained without difficulty and of superior finish. A resolution was accordingly passed by the Committee, which, together with a plan of the proposed obelisk, was forwarded to Professors Forbes and Henderson, of Edinburgh, with a request that those gentlemen would kindly undertake the necessary superintendence of the work; a request which they acceded to with alacrity; and the obelisk, in packing cases, arrived in Table Bay in the month of August 1841, where it was safely landed under the guidance of Colonel Lewis.

The following is the report of Colonel Lewis on the erection :—

" In excavating the foundation, which was of black sand, it was found necessary to go down 4 feet 10 inches to arrive at the iron-

stone gravelly bed, the substratum of the country about Feldhausen. The masonry foundation was formed of concrete, built up in courses of 12 or 14 inches, and composed of iron-stone, gravel, and lime-mortar, well grouted together. On this masonry bed a granite platform 9 feet 6 inches square was laid, and the small column fixed by Sir John Herschel on the site of the 20-feet reflector. This mark was removed for a few days, in order to bring the masonry foundation to a proper height, but the mark was relaid with mathematical correctness by Lieut. Laffau, Royal Engineers.

"Previously, however, to relaying the Herschel mark, the suggestion of the Committee of construction was adopted of placing under it several silver and copper coins, a few inscription medals, and medals of the South African Institution, struck in silver for the occasion; and on the obverse were engraved some notices, statistical and geographical, of the colony; the discoveries of Capt. Ross in the South Polar Regions in 1841; and the operation of remeasuring the arc of the meridian in 1842. These subjects were beautifully executed by Mr. Piazzi Smyth, assistant-astronomer, and hermetically sealed in glass bottles. Also there were deposited a map of the colony and engravings of nebulæ observed at Slough from 1825 to 1833, by Sir John Herschel, and a plan of Mr. Maclear's triangulation connecting the site of Feldhausen with the Royal Observatory and the site of La Caille's observatory, in Strand Street, Cape Town.

"The bottle was carefully fixed in a block of teak-wood, scooped out on purpose.

"When the granite platform was brought to its level, and the Herschel mark refixed and filled in with cement, it was necessary to erect heavy shears of large spars, to place the stones of the obelisk, composed of large blocks of Craigleith stone, some weighing two tons, sent from Scotland by Professors Forbes and Henderson, who kindly took this charge. This was accomplished with some trouble and expense, and the base of the obelisk was laid with the faces corresponding with the four cardinal points. The whole was completed on the 15th of February, 1842, in presence of some of the Committee and several of the subscribers and friends of Sir John Herschel, who attended on the occasion of placing the top stone of the obelisk.

"The obelisk has the base 6 feet square by 6 feet in height, and the pyramidal part stands 12 feet above the base. On the east face is an opening shewing the Herschel mark, designating the site of the 20-feet reflector. The opening will be closed with a bronze plate, containing the inscription of the purpose for which the obelisk is erected."

VI. On Loud Beats of Clocks used in Observatories. By J. S. Eiffe, Esq.

This paper gives an explanation of a simple and easily applied method of obtaining very loud beats for the astronomical clock. The author alludes to the difficulty which has been hitherto ex-

perienced in obtaining any sound in the beat of astronomical clocks at all approaching that which is necessary for distinctness under ordinary circumstances. He then adverts to the necessary irregularities in the clocks of the ordinary construction, arising from the largeness and imperfection of the workmanship of the brass-work, and hints at a method which he has devised, whereby the present large circle of seconds can be retained with a small and delicate movement, such as those used in marine chronometers, and without any intermediate wheel.

But without a method to enable the observer to increase at pleasure the loudness of the beats, it is manifest that the beats of such a clock would not be loud enough for the ordinary purposes of an observatory; and the author's invention, described in the present paper, is intended to supply this deficiency by the introduction of an apparatus to produce loud beats simultaneously with the escape of the seconds' wheel from one pallet to the other, which is totally independent of the size and weight of metal of the works of the clock. The mode of constructing the apparatus is as follows:—

Two pieces of thin brass are placed at the sides of the frame-work of the clock, in length the same as the space between the pillars; in width, about two inches or more at pleasure; these pieces of brass are placed horizontally, at about the same altitude from the base as the axis of the escape-wheel pinion, and at right angles to it, or nearly so. They should be made of such a size as would insure a sound, distinct, sharp, and short. The little tables can be made to any size, as is mentioned above. Upon these tables or plates two hammers ply, supported by arbors at the same elevation as all the others. The pivots should be made small for easy motion. The hammers are intended to beat upon the middle of each brass table simultaneously with the drop proper of the escape-wheel: through the agency of the pendulum, they are lifted alternately by the heels of the anchors of the pallets, assisted by a passing spring similar to that used in the chronometer escapement. It has just been observed, that the arbors which support those little hammers are placed at the same elevation from the base of the brass frame-work of the clock as the escape-wheel arbor, but at the sides, and as near to the edge as possible. About the centre, or midway between them, are affixed brass collets, about 1-8 of an inch in thickness, and 1-4 of an inch in diameter. Two slender pieces of spring are secured to the collets by screws passing through square holes formed longitudinally, to secure power of adjustment for bringing the arms into proper contact with the anchor of the pallets. The little hammers beat upon the plates or tables at one end, and at the other the lifting action takes place, assisted by the passing spring. The strokes upon these brass tables have a peculiar sharpness of tone, which can be accounted for in some measure, when it is considered that they are very different from the sounds produced by the teeth of the wheel itself; in the dead-beat escapement the teeth have a sliding

motion in the moment of drop, but not impulse, for it is well known that that is subsequent to the sound. The exertions to obtain sound have for some years been considerable; but the result has been a poor recompense, and unimportant after all. Thus then, and by such application, simple and easy to be understood, is it proposed to obtain sound, so loud as to be *distinct in the stormiest night;* but as the constant connexion of such apparatus would neither be desirable as concerns the action of the clock, nor pleasant to the ear as a companion, a mode has been introduced of readily detaching it altogether. By a certain method, which shall be explained, the hammers are raised from the tables at one end, and the arms at the other entirely disengaged from the anchor of the pallets, without the least inconvenience or disturbing action to the clock itself. This is very pleasing, and greatly to be desired, and perhaps may be considered of nearly equal importance with the invention itself by which a loud beat is obtained. The apparatus within is immediately, and at pleasure, acted upon through the agency of a bolt, which is placed vertically, immediately over the 60 minutes, or about two inches back, sufficiently long to reach a spring of hard brass, which is about half an inch wide, and which passes transversely over the frame-work of the clock, and is fixed securely to the back board of the clock-case. Now the mode in which the spring unites its action with the rest of the apparatus is by slight cross-bars, which extend to the extremities of the sides of the frame, so that the ends are immediately over the hammers, with which they are connected by silk threads. Therefore, by pressing down the bolt before named, the hammers are allowed to fall into action, and do their duty simultaneously with the teeth of the wheel upon the pallets. While the little hammers are in action, the teeth of the wheel are no longer heard, and the motion and view of the seconds hand, as well as the ear of the inquirer, will satisfy him as to the usefulness of the invention.

In conclusion, and to endeavour to dispel any doubts that may arise as to the probable advantages to be obtained by such assistance to the observatory, the opinion and satisfaction expressed by word and by letter, on those advantages, by the distinguished individual who is at the head of our national observatory, will, it cannot be doubted, be interesting to this learned Society. The Astronomer Royal declares by letter, that he has examined the plan, and is enabled to say that it answers completely for its proposed purpose; and that it appears likely to be very useful. Moreover, that the rate of the clock will not necessarily be disturbed during the time of its connexion—though that will greatly depend on certain conditions.

London :—Printed by Moyes and Barclay, Castle Street, Leicester Square.